



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/533,460

05/02/2005

Saburo Furusho

1417-505

4067

23117 7590 05/21/2008
NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER

CALANDRA, ANTHONY J

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

05/21/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/533,460	Applicant(s) FURUSHO ET AL.	
	Examiner ANTHONY J. CALANDRA	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/07/2007 and 5/02/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

Detailed Office Action

1. The communication dated 5/02/2005 has been entered and fully considered.
2. Claim 1 is pending.

Specification

3. The disclosure is objected to because of the following informalities:
Spelling errors 'caustification' should be causticization.
Appropriate correction is required.

Claim Objections

4. Claim 1 is objected to because of the following informalities:
Spelling error 'dosium sulfate' should be 'sodium sulfate'.
Spelling error 'recofered' should be recovered.
Spelling errors 'caustification' should be causticization.
In line 3, 'as main components' better stated as 'as the main components'.
Also applicant refers to 'black solution', 'green solution' and 'white solution', the typical industry term for these solutions would be 'black liquor solution', 'green liquor solution' and 'white liquor solution'.
Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1791

6. Claim 1 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In lines 5 and 6, applicant states 'which are turned from the cooking liquor, therefrom'. This language is confusing and fails to particularly point out the meets and bounds of the claim. This line would be better worded as, for example, 'which are by-products of the cooking liquor formed during the cooking process.'

Claim 1 recites the limitation "aqueous solution" in the last two lines of page 1 of the claim. There is insufficient antecedent basis for this limitation in the claim. Applicant does not actively state in the claim the precipitator dust is first diluted to form said aqueous solution.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 1791

9. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Handbook for Pulp and Paper Technologists* by SMOOK in view of JP 2002-138382 KONO et al., hereinafter KONO and U.S. Patent # 5,616,280 MOORE et al., hereinafter MOORE, and/or in the alternative MOORE in view of SMOOK and KONO.

Examiner notes that steps A through F of the first paragraph read on virtually every bleached kraft mill in the United States and the world. However for completeness of the record the examiner has cited the generalist review textbook SMOOK.

SMOOK discloses a process for producing kraft pulp using a cooking step of raw chips with sodium hydroxide and sodium sulfide (*process for producing kraft pulp, which comprises: (A) a cooking step of treating raw chips with a cooking liquor containing sodium hydroxide and sodium sulfide as main components to convert the chips into pulp* [pg. 74 section 7.2 and figure 7-1]). SMOOK further discloses washing the pulp and recovering the result organic and inorganic chemicals (*(B) a pulp washing step of washing the resultant pulp, and separating and recovering a black solution containing sodium carbonate and sodium sulfate, which are turned from the cooking liquor, therefrom* [pg. 74 Figure 7-1, pg. 75, pg.76, Figure 7-3]). SMOOK discloses that an alkaline extraction stage is a common bleaching stage for kraft pulps (*a pulp bleaching step of treating the pulp with a bleaching agent in the presence of alkali* [pg. 163-64, 174-175]). SMOOK further discloses concentrating the weak black liquor in evaporators which was recovered from the washers (*(D) a black solution concentrating step of concentrating the black solution separated and recovered in the pulp washing step (B)* [pg. 76 Figure 7-3]). SMOOK discloses burning the black liquor in a recovery furnace which converts the sodium sulfate to sodium sulfide and further recovers ashes in a electrostatic precipitator

Art Unit: 1791

((E) *a black solution combustion step of burning the concentrated black solution to reduce the sodium sulfate into sodium sulfide and further recovering ashes containing sodium sulfate and sodium carbonate from a combustion exhaust gas generated therein by a dust collector* [pg. 74 Figure 7-1, pg. 76, Figure 7-3, pg. 148, Figure 10-25]). The liquid smelt from the recovery boiler is causticized using calcium oxide to form sodium hydroxide and the formed white liquor is reused in the cooking step ((F) *a caustification step of treating a green solution as an aqueous solution of a smelted product recovered from the combustion step with calcium oxide to reduce sodium carbonate contained in the green solution to sodium hydroxide, thereby obtaining a white solution, said white solution recovered in the caustification step (F) being recycled to the cooking step (A)* [pg. 74 Figure 7-1, pg. 76, Figure 7-3, pg. 149-150]).

SMOOK does not disclose treating the recovered precipitator ash in any way before mixing it with the black liquor from solution from the evaporation step [pg. 148]. KONO discloses using a cation exchange resin to absorb potassium ions from ashes generated in a recovery boiler electrostatic precipitator [paragraphs 0008 and 0009]. The ashes are then diluted to form a solution of ashes [paragraph 0010]. The potassium is removed by a Na type regeneration which is done by a method comprising treating it with caustic alkali of sodium, sodium hydroxide (*solution combustion step (E) by the dust collector through a packed bed filled with a Na-type cation exchange resin to adsorb and remove potassium ions contained in the aqueous solution; and (H) a regeneration step of treating the cation exchange resin used in the potassium ion removal step (G) with an aqueous sodium hydroxide solution to regenerate the cation exchange resin* [paragraph 0023]).

At the time of the invention it would have been obvious to treat the precipitator ash of SMOOK using the cationic exchange resin of KONO prior to the ash being recombined with the concentrated black liquor. A person of ordinary skill in the art would be motivated to do so to remove chlorides and potassium from the liquor cycle which cause corrosion as suggested by KONO [paragraph 0003].

Neither SMOOK nor KONO disclose where the spent caustic alkali which is used to regenerate the packed bed ion exchanger would be sent. MOORE discloses that in pulp bleaching sodium hydroxide and potassium hydroxide can both be used for bleaching successfully[abstract, claims 11 and 12, column 2 lines 33-44]. At the time of the invention it would have been obvious to use the spent caustic alkali containing potassium hydroxide from regenerating the ion exchanger of KONO in the bleaching process of SMOOK. It is obvious that a person of ordinary skill in the art would be motivated to recycle spent chemicals to process that needs said waste chemicals and MOORE states that potassium/sodium hydroxide can be used in bleaching. SMOOK discloses that spent chemicals are typically recycled in kraft mills, for example, the whole kraft recovery cycle, the lime cycle, precipitator ash reclaim, and using waste sulfuric acid for salt-cake makeup [pg. 149]. Such recycling allows the mill to be profitable and provides financial motivation. Further, it would have been *prima facie* obvious to substitute the sodium/potassium hydroxide solution produced by the ion-exchange resin for the sodium hydroxide used in the alkaline extraction bleaching of SMOOK. A person of ordinary skill in the art would reasonably expect success as MOORE teaches that sodium/potassium hydroxide can be interchanged.

Art Unit: 1791

In the alternative, it would have been obvious to produce the needed sodium/potassium solution described by MOORE using the process of SMOOK/KONO. It is *prima facie* obvious to substitute prior art elements to yield predictable results. In the instant case MOORE describes a bleaching process that requires sodium/potassium hydroxide chemicals. The process of SMOOK/KONO discloses a method for producing said sodium/potassium hydroxide chemicals. Therefore, without evidence to the contrary it would be obvious to a person of ordinary skill in the art to substitute the potassium/sodium hydroxide solution of MOORE with the potassium/sodium hydroxide of SMOOK/KONO. As both solutions contain the same chemicals a person of ordinary skill in the art would reasonably expect success.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571) 270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1791

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven P. Griffin/
Supervisory Patent Examiner, Art Unit
1791

AJC